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| 10/581,667 | 06/05/2006 | Taichi Majima | 0670-7075 | 4570 |
| 31780 7590 09/10/2010 Robinson Intellectual Property Law Office, P.C. 3975 Fair Ridge Drive Suite 20 North Fairfax, VA 22033 | | | | |
| EXAMINER | | | | |
| YU, LIHONG | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/581,667

Applicant(s)

MAJIMA, TAICHI

Examiner

LIHONG YU

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2010.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-34 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 25-34 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 05 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SI.08)
4) ☐ Interview Summary (PTO-413)
5) ☐ Notice of Interval Patent Application
6) ☐ Other: _____
Paper No(s)/Mail Date _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 12, 2010 has been entered.

Claim Objections

2. Claim 34 is objected to because of the following informalities:

In claim 34, line 7, a comma “,” should be added to the front of the word “**adding**”.

Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re*

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Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claim 25 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 8 of copending Application No. 12/419,559.

Claim 31 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 9 of copending Application No. 12/419,559.

Claim 33 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 8 of copending Application No. 12/419,559.

Claim 34 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 9 of copending Application No. 12/419,559.

A comparison of claims is presented in the table below:

| Instant Application 10/581,667 | Application 12/419,559 |
|--|---|
| <p>25. (New) A transmission device for <u>transmitting data using four symbol values</u>, the transmission device comprising:</p> <p><u>a division unit configured to be inputted with original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected</u></p> | <p>8. (New) A method for <u>transmitting data using four symbol values</u> whose data bits become the arrangement of the Gray code, the method comprising the steps of:</p> <p><u>inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, to</u></p> |

and the second data being to be unprotected, and to divide the first data into first bit data by one bit and divides the second data into second bit data by two bits;

a redundant bit addition unit configured to add a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values; and

a modulation unit configured to perform modulation on the basis of the first bit data with the redundant bit being added and the second bit data.

31. (New) A reception device comprising:

a demodulation unit configured to receive and demodulate a transmission signal in which data has been transmitted using four symbol values, wherein the transmission signal is obtained by inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, dividing the first data into first bit data by one bit and dividing the second data into second bit data by two bits adding a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values, and performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data;

divide the first data into first bit data by one bit and divides the second data into second bit data by two bits;

adding a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values; and

performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data.

9. (New) A method for receiving data comprising the steps of:

receiving and demodulating a transmission signal in which data has been transmitted using four symbol values whose data bits become the arrangement of the Gray code, wherein the transmission signal is obtained by inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, dividing the first data into first bit data by one bit and dividing the second data into second bit data by two bits adding a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values, and performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data;

| | |
|--|---|
| <p>a symbol decision unit configured to <u>perform a symbol decision at each Nyquist interval for the signal demodulated by the demodulation unit</u></p> <p>a bit conversion unit configured to <u>convert a symbol value obtained by the symbol decision performed by the symbol decision unit into a bit value; and</u></p> <p>a data recovery unit configured to <u>compose a data string by deleting the added redundant bit from the data of the bit value converted by the bit conversion unit, to restore original data.</u></p> <p>33. (New) A method for transmitting data using four symbol values, the method comprising the steps of:</p> <p><u>inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, dividing the first data into first bit data by one bit and dividing the second data into second bit data by two bits;</u></p> <p><u>adding a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values; and</u></p> <p><u>performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data.</u></p> | <p><u>performing a symbol decision at each Nyquist interval for the signal demodulated in the demodulating step;</u></p> <p><u>converting a symbol value obtained by the symbol decision performed in the symbol deciding step into a bit value; and</u></p> <p><u>composing a data string by deleting the added redundant bit from the data of the bit value converted in the symbol value converting step, to restore original data.</u></p> <p>8. (New) A method for transmitting data using four symbol values whose data bits become the arrangement of the Gray code, the method comprising the steps of:</p> <p><u>inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, to divide the first data into first bit data by one bit and divides the second data into second bit data by two bits;</u></p> <p><u>adding a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values; and</u></p> <p><u>performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data.</u></p> |
|--|---|

34. (New) A method for receiving data comprising the steps of:

receiving and demodulating a transmission signal in which data has been transmitted using four symbol values, wherein the transmission signal is obtained by inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, dividing the first data into first bit data by one bit and dividing the second data into second bit data by two bits adding a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values, and performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data;

performing a symbol decision at each Nyquist interval for the signal demodulated in the demodulating step;

converting a symbol value obtained by the symbol decision performed in the symbol deciding step into a bit value; and

composing a data string by deleting the added redundant bit from the data of the bit value converted in the symbol value converting step, to restore original data.

9. (New) A method for receiving data comprising the steps of:

receiving and demodulating a transmission signal in which data has been transmitted using four symbol values whose data bits become the arrangement of the Gray code, wherein the transmission signal is obtained by inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, dividing the first data into first bit data by one bit and dividing the second data into second bit data by two bits adding a redundant bit as a lower order bit to each of the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values, and performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data;

performing a symbol decision at each Nyquist interval for the signal demodulated in the demodulating step;

converting a symbol value obtained by the symbol decision performed in the symbol deciding step into a bit value; and

composing a data string by deleting the added redundant bit from the data of the bit value converted in the symbol value converting step, to restore original data.

Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 25-31, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,311,306 B1) in view of Labonte et al (US 5,828,672).

Consider claims 25 and 33:

White discloses a method for transmitting data using four symbol values (*see White at Fig. 3, col. 6, lines 59-67 and col. 7, lines 1-5, where White describes a 4-ary amplitude modulation scheme with Gray code 11, 10, 00 and 01 as data symbols*), the method comprising the steps of:

- inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data (*see White at Fig. 2 and col. 4, lines 41-64, where White describes the data comprises a set ($A_0, A_1, \dots, B_0, B_1, \dots$), wherein A_0, A_1, \dots are more important code bits and B_0, B_1, \dots are less*

- important code bits*), the first data being to be protected and the second data being to be unprotected (see *White at Fig. 5 and col. 9, lines 34-67, where White describes transmitting the low importance data bits with no error control coding and a coder 504 to code the codeable information, that is the important data bits*);
- adding a redundant bit as a lower order bit to the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values (see *White at col. 9, lines 20-25, where White describes the more important bits are provided with redundancy*; see *White at Fig. 3, col. 6, lines 59-67 and col. 7, lines 1-5, where White describes four 2-bit symbol values: +3, +1, -1 and -3, the symbol values +3 and +1 are the two symbol values whose gain is higher at the Nyquist point; one skilled in the art knows that the Nyquist point is the sampling point at which a symbol value is determined*); and
 - performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data (see *White at col. 6, lines 59-67 and col. 7, lines 1-5, where White describes the symbols are modulated*).

However, White does not specifically disclose: (1), dividing the first data into first bit data by one bit and dividing the second data into second bit data by two bits and (2), one redundancy bit is added to each of the first bit data.

Regarding (1) and (2) above, in an analogous art, Labonte discloses dividing a first data into first bit data by one bit and dividing a second data into second bit data by two bits, and

one redundancy bit is added to each of the first bit data (see *Labonte at Fig. 3 and col. 5, lines 46-60, where Labonte describes data bits are divided into Class 1 bits and Class 2 bits; Class 1 bits are protected with a one-to-two coder in which one redundancy bit is added for each voice bit, Class 2 bits are not protected; Class 2 bits are 82 bits in length, that is 41 two-bits*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, to divide the first data into first bit data by one bit, to divide the second data into second bit data by two bits, and to add a redundant bit to each of the first bit data, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (see *Labonte at col. 5, lines 30-46*).

Consider claims 31 and 34:

White discloses a method for receiving data (see *White at col. 8, lines 45-67, where White describes decoding the received symbols*) comprising the steps of:

- receiving and demodulating a transmission signal in which data has been transmitted using four symbol values, wherein the transmission signal is obtained by inputting original data arranged in order from one with highest importance, the original data comprising first data and second data after the first data, the first data being to be protected and the second data being to be unprotected, adding a redundant bit as a lower order bit to the first bit data as a higher order bit to create 2 bits data which results in a symbol having any one of two symbol values whose gain is higher at the Nyquist point, of the four symbol values, and performing modulation on the basis of the first bit data with the redundant bit being added and the second bit data (see *the discussion for claim 1 above, where White discloses the transmitted symbols as*

recited here; see White at col. 8, lines 45-65, where White describes decoding the received symbols by a data recipient);

- performing a symbol decision at each Nyquist interval for the signal demodulated in the demodulating step (*see White at col. 8, lines 45-65, where White describes decoding the received symbols to determine what bits were transmitted by a data source when a symbol is received);*
- converting a symbol value obtained by the symbol decision performed in the symbol deciding step into a bit value (*see White at col. 8, lines 45-65, where White describes decoding the first bit and the second bit of each 2-bit word; see White at Fig. 3 and col. 7, lines 6-31, where White shows the constellation and mapping a symbol to its value); and*
- composing a data string to restore original data (*see White at col. 8, lines 45-65 and col. 7, lines 6-31).*

However, White does not specifically disclose: (1), divide the first data into first bit data by one bit and divide the second data into second bit data by two bits; (2), one redundancy bit is added to each of the first bit data; and (3), deleting the added redundant bit from the data of the bit value converted in the symbol value converting step.

Regarding (1), (2) and (3) above, in an analogous art, Labonte discloses dividing a first data into first bit data by one bit and dividing a second data into second bit data by two bits, and one redundancy bit is added to each of the first bit data (*see Labonte at Fig. 3 and col. 5, lines 46-60, where Labonte describes data bits are divided into Class 1 bits and Class 2 bits; Class 1 bits are protected with a one-to-two coder in which one redundancy bit is added for each voice*

bit, Class 2 bits are not protected; Class 2 bits are 82 bits in length, that is 41 two-bits), and deleting the added redundant bit from the data of the bit value (see Labonte at col. 4, lines 11-27, where Labonte describes the redundancy bits are removed at the receiver).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, to divide a first data into first bit data by one bit, to divide a second data into second bit data by two bits, to add a redundant bit to each of the first bit data and to delete the added redundant bit from the data of the bit value converted in the symbol value converting step, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

Consider claim 26:

White in view of Labonte discloses the invention according to claim 25 above. White discloses each of the first data to be protected comprises flag data (*see White at Fig. 2 and col. 4, lines 41-64, where White describes a subdivider 202 that divides a code vector 111 into two subsets of code bits 204 and 206, therefore, each data has a flag to indicate its level of importance*).

Consider claim 27:

White in view of Labonte discloses the invention according to claim 25 above. However, White does not specifically disclose the original data includes bits for error check and the first data to be protected includes the bits for error check.

Labonte teaches a original data includes bits for error check and a first data to be protected includes bits for error check (*see Labonte at col. 5, lines 46-60 and col. 6, lines 12-29, where Labonte describes applying 7 CRC bits to the class 1 bits for error check*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to have that the original data includes bits for error check and the first data to be protected includes the bits for error check, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

Consider claim 28:

White in view of Labonte discloses the invention according to claim 25 above. However, White does not specifically disclose the original data includes bits for error correction and the first data to be protected includes the bits for error correction.

Labonte teaches a original data includes bits for error correction and a first data to be protected includes bits for error correction (*see Labonte at col. 6, lines 12-29, where Labonte describes that if there is a CRC discrepancy, then the frame is dropped by the CRC decoder, that is, the CRC is used for error correction*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to have that the original data includes bits for error correction and the first data to be protected includes the bits for error correction, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

Consider claim 29:

White in view of Labonte discloses the invention according to claim 25 above. However, White does not specifically disclose the number of the first data to be protected is less than the number of the second data to be unprotected.

Labonte teaches the number of the first data to be protected is less than the number of the second data to be unprotected (*see Labonte at col. 5, lines 46-60, where Labonte describes 77 class 1 bits which has error protection, and 82 class 2 bits which has no error protection*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to have that the number of the first data to be protected is less than the number of the second data to be unprotected, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

Consider claim 30:

White in view of Labonte discloses the invention according to claim 25 above. White discloses the original data represents a plurality of pieces of information (*see White at Fig. 2 and col. 4, lines 41-64, where White describes a code vector 111*), and the redundant bit addition unit operates for respective ones of the plurality of pieces of information (*see White at col. 9, lines 20-25, where White describes the more important bits are provided with redundancy*).

White does not specifically disclose adding the redundant bit to each of the first data to be protected to generate coded data.

Labonte discloses adding the redundant bit to each of the first data to be protected to generate coded data (*see Labonte at Fig. 3 and col. 5, lines 46-60, where Labonte describes data bits are divided into Class 1 bits and Class 2 bits; Class 1 bits are protected with a one-to-two coder in which one redundancy bit is added for each voice bit, Class 2 bits are not protected; Class 2 bits are 82 bits in length, that is 41 two-bits*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to add the redundant bit to each of the first data to be protected to generate coded data, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

7. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,311,306 B1) in view of Labonte et al (US 5,828,672), as applied to claim 31 above, and further in view of Persson (US 4,277,778).

Consider claim 32:

White in view of Labonte discloses the reception device according to claim 31 above. White does not disclose the demodulation unit demodulates the received signal by converting the received signal into a signal of a voltage corresponding to a frequency of the received signal, and the symbol decision unit performs the symbol decision by comparing the voltage of the signal, which has been demodulated by the demodulation unit, with preset threshold values.

Persson teaches demodulating a received signal by converting the received signal into a signal of a voltage corresponding to a frequency of the received signal, and performing the

symbol decision by comparing the voltage of the signal, which has been demodulated by the demodulation unit, with preset threshold values (*see Persson at Fig. 4, col. 3, lines 64-68 and col. 4, lines 1-15, where Persson describes a FSK demodulator with a comparator*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, to demodulate the received signal by converting the received signal into a signal of a voltage corresponding to a frequency of the received signal, and to perform the symbol decision by comparing the voltage of the signal, which has been demodulated by the demodulation unit, with preset threshold values, as taught by Persson, thus allowing for generating quick results, as discussed by Persson (*see Persson at col. 1, lines 10-27*).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIHONG YU whose telephone number is (571) 270-5147. The examiner can normally be reached on 8:30 am-7:00 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lihong Yu/
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611